

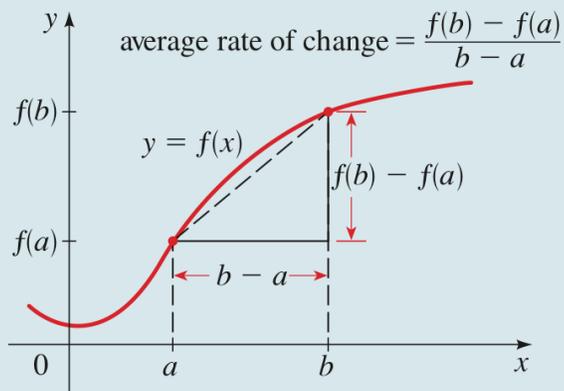
§2.4 AVERAGE RATE OF CHANGE

AVERAGE RATE OF CHANGE

The **average rate of change** of the function $y = f(x)$ between $x = a$ and $x = b$ is

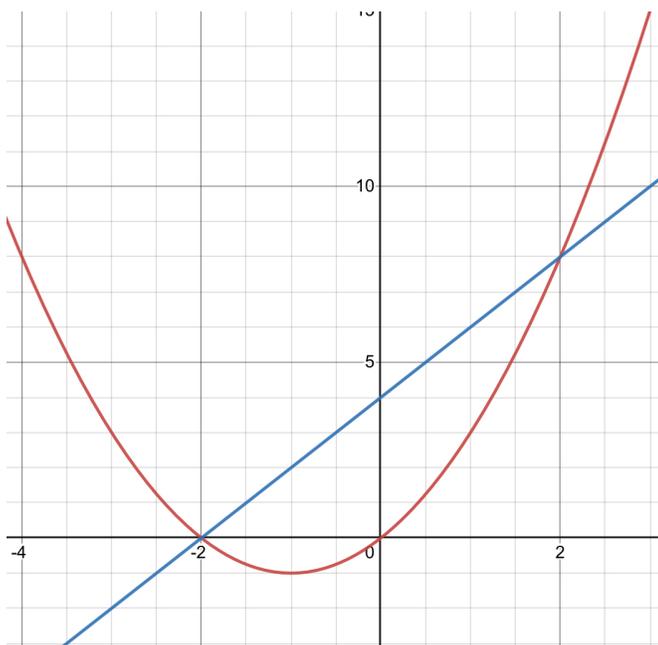
$$\text{average rate of change} = \frac{\text{change in } y}{\text{change in } x} = \frac{f(b) - f(a)}{b - a}$$

The average rate of change is the slope of the **secant line** between $x = a$ and $x = b$ on the graph of f , that is, the line that passes through $(a, f(a))$ and $(b, f(b))$.



ex. Let $f(x) = (x+1)^2 - 1$.

- CALCULATE THE **AVERAGE RATE OF CHANGE** FROM $x = -2$ TO $x = 2$
- WHAT IS THE **SLOPE** OF THE **LINE** CONNECTING $(-2, f(-2))$ & $(2, f(2))$?
- WHAT IS THE **EQUATION** OF THE **LINE** CONNECTING $(-2, f(-2))$ & $(2, f(2))$?
- WHAT IS THE **NET CHANGE** OF f FROM $x = -2$ TO $x = 2$?



<https://www.desmos.com/calculator/tvrrdwhpob>

ex. Let $f(x) = 2x^2 - x$.

FIND THE AVERAGE RATE OF CHANGE OF f FROM $x = a$ TO $x = a + h$.
(SIMPLIFY)

ex. ↑ WHAT IF $f(x) = \sqrt{x}$?
(RATIONALIZE THE DENOMINATOR)